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## **Climate Prediction Center Fall (SON) and Winter Outlooks (DJF)**

David DeWitt (with contributions from  
CPC Staff)



# Outline



- Background on CPC ENSO forecast process
- ENSO forecast
- Background on CPC ENSO Seasonal Temperature and Precipitation Outlooks
- CPC Fall/Winter Temperature and Precipitation Outlooks
- Drought Outlook for August-October
- Summary/Key Points



# CPC ENSO Forecast Process



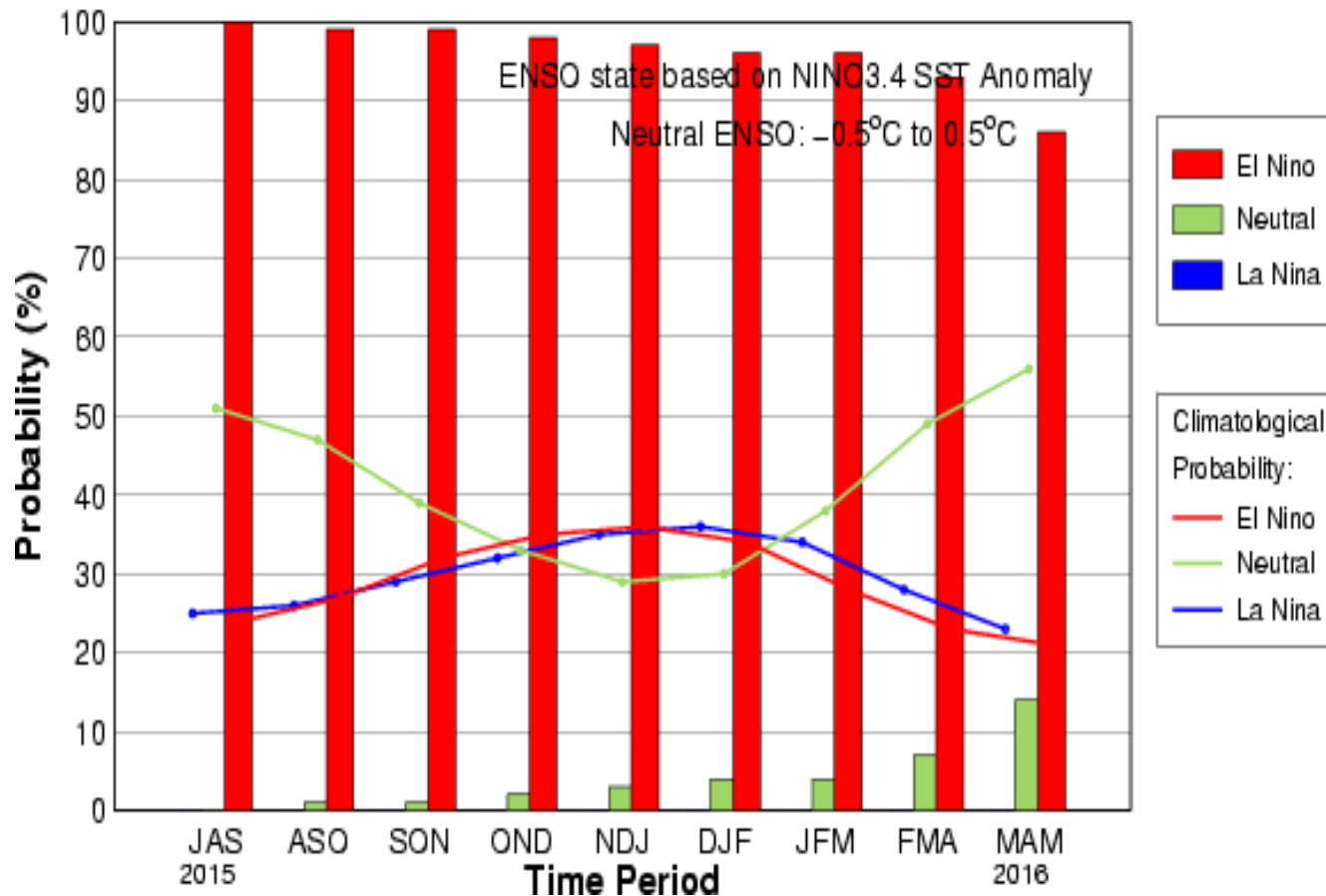
- CPC uses a consensus based approach based on input from internal and community experts to produce its ENSO forecast.
- Tools used in CPC ENSO Forecast Process Include:
  - Dynamical model forecasts
  - Statistical model forecasts
  - Recent and current observations of relevant fields measuring strength of event and of atmosphere-ocean coupling including:
    - Southern Oscillation Index (Measures atmospheric response to SST anomalies)
    - Equatorial Pacific wind anomalies (Measures atmospheric response to SST anomalies)
    - Equatorial Pacific precipitation anomalies (measures atmospheric response to SST anomalies)
    - Equatorial Pacific sub-surface temperature anomalies (measures oceanic response to wind anomalies)



# ENSO Forecast from July 2015



Mid-Jul IRI/CPC Plume-Based Probabilistic ENSO Forecast

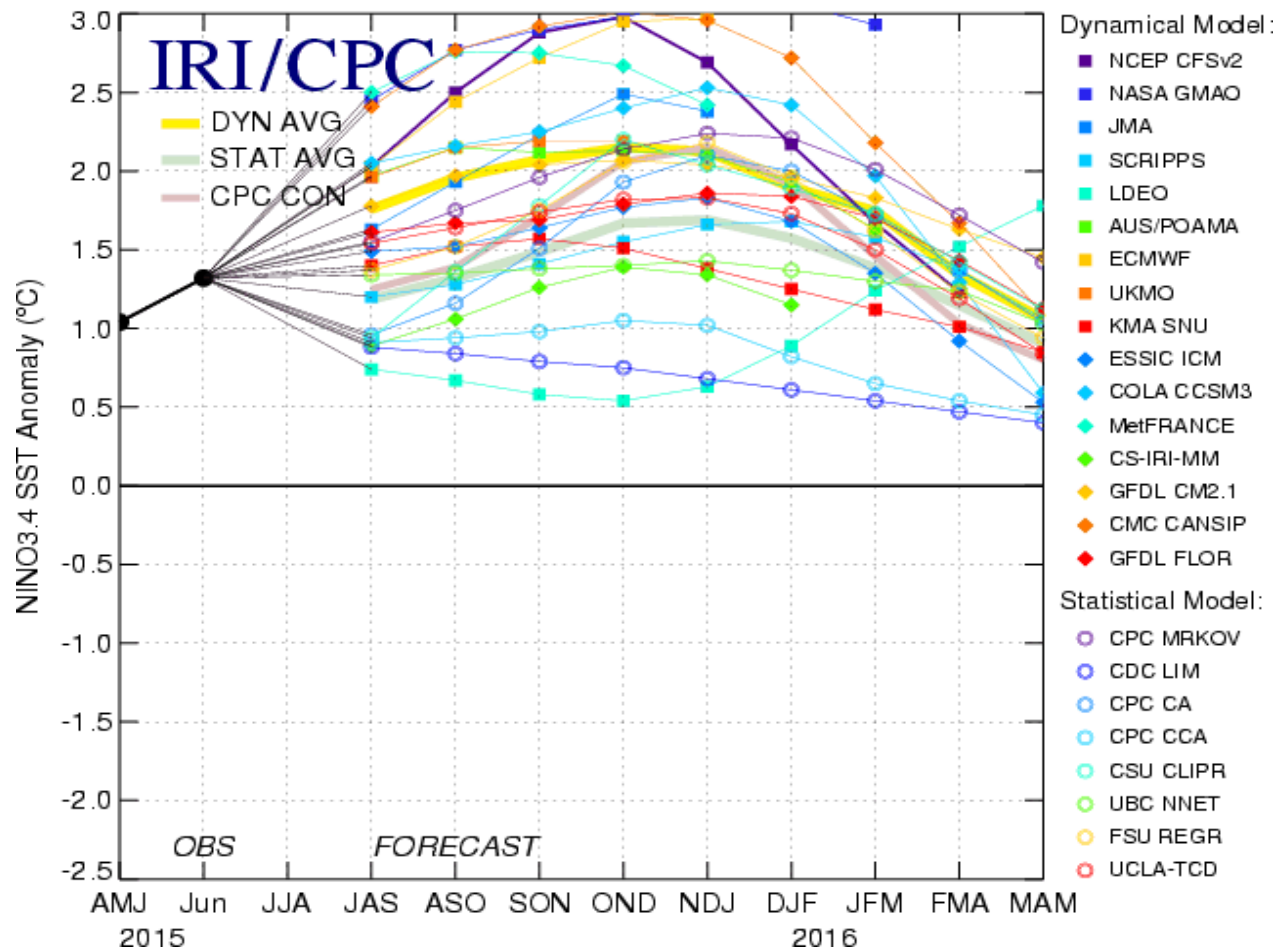


**CPC forecasts over 90% probability that ENSO will last through NH Winter.**

**Strength of ENSO is forecast to be strong, i.e. greater than  $1.5^{\circ}\text{C}$  in late fall early/ winter**

# ENSO Predictions from Dynamical and Statistical Models

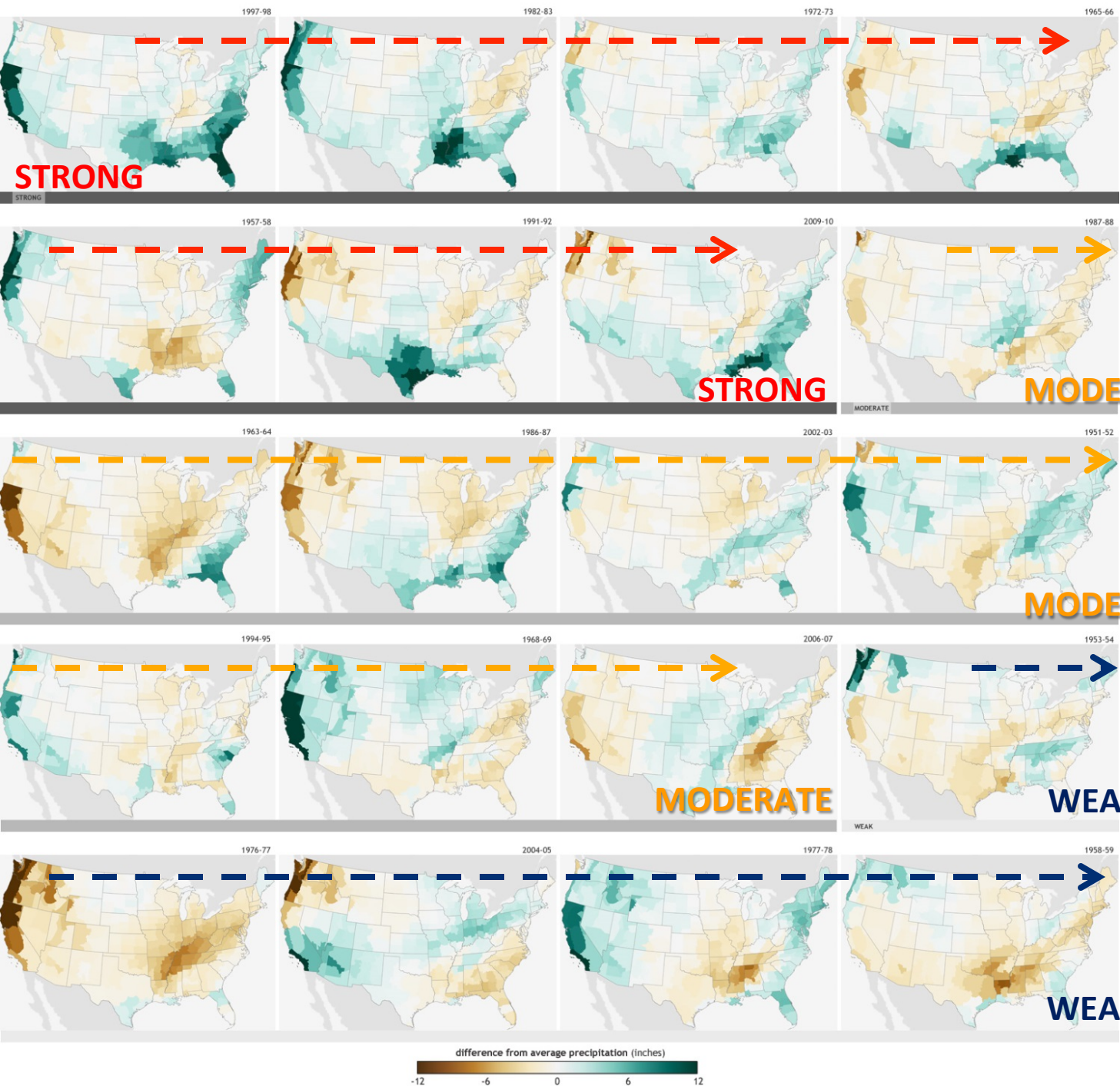
Mid-Jul 2015 Plume of Model ENSO Predictions



**Note that amplitude of SST anomalies from some dynamical models is known to be too strong historically.**

**However, even if this is corrected we anticipate a strong event, i.e. peak SST > 1.5°C.**

Winter (December-February) precipitation patterns during strong, moderate, and weak El Niño events since 1950



# ENSO

Dec-Jan-Feb

ENSO impact  
on US  
precipitation  
varies from  
event to event.





## CPC Seasonal Outlooks

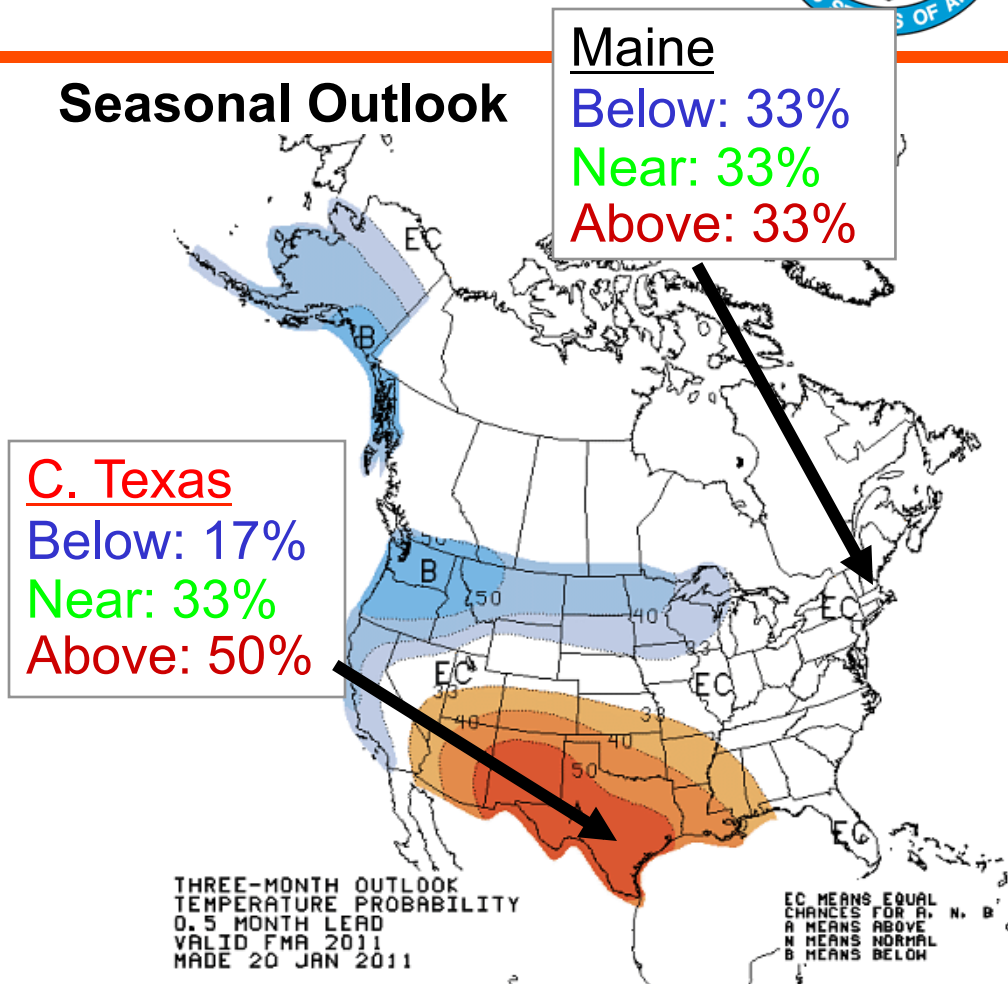


CPC Seasonal Outlooks are constructed by forecasters using several tools including:

- Dynamical Models
- Statistical Models
- Historical Analogs
- Historical Composites

Each of the forecast tools has strengths and weaknesses. **Different tools can have complementary skill.**

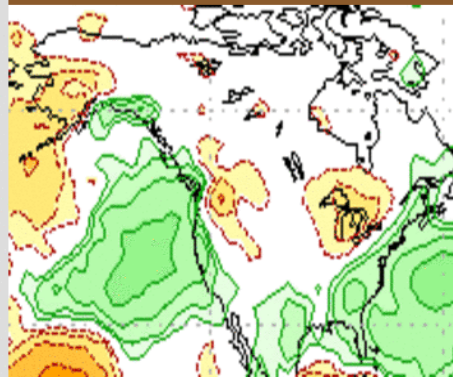
### Seasonal Outlook



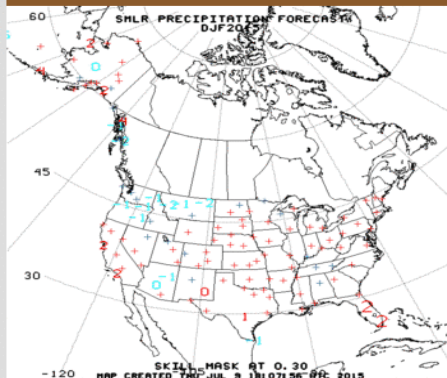
**Forecasts are Tercile Probabilities with Dominant Probability Shaded**

# DJF 2015 [Precipitation]

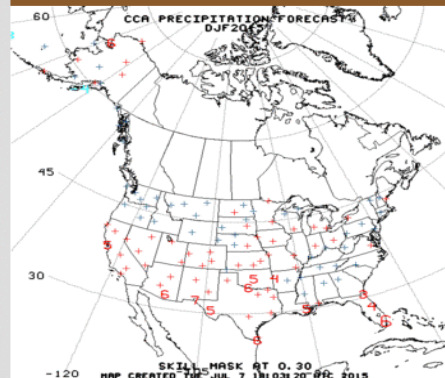
## SST CA (DJF 2015)



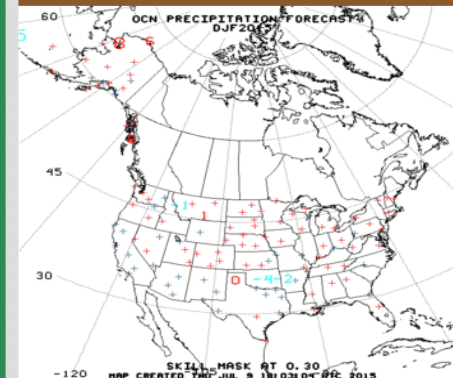
## SMLR



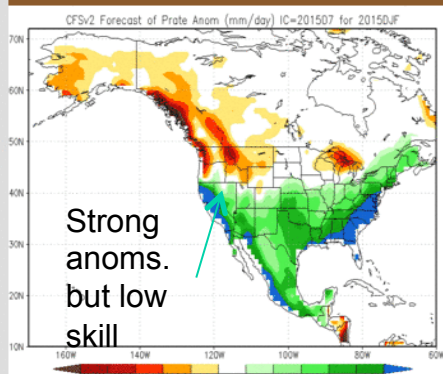
## CCA



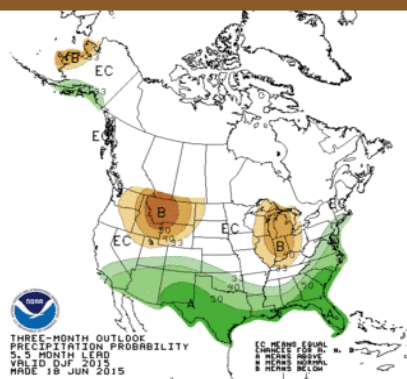
## OCN



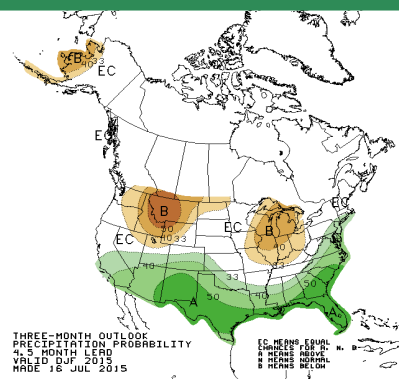
## CFSv2



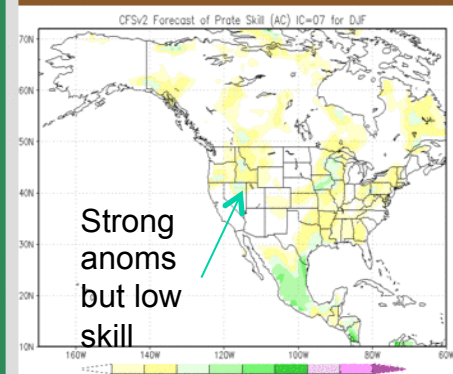
## OLD OUTLOOK



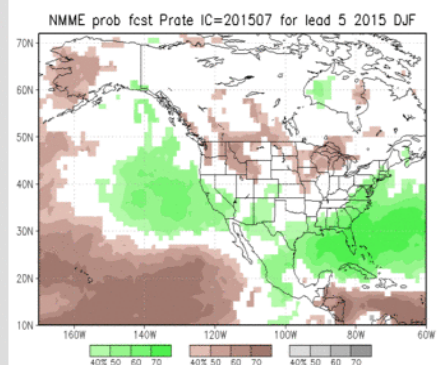
## \*\* NEW OUTLOOK \*\*



## CFSv2 (skill)



## NMME (Probs)



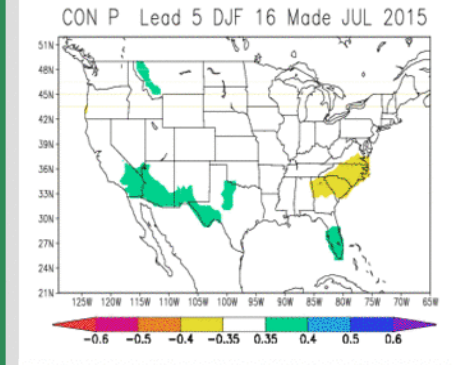
## IRI

IMAGE  
NOT  
AVAILABLE

## ECCA

IMAGE  
NOT  
AVAILABLE

## CONSOLIDATION







# CPC Seasonal Temperature and Precipitation Outlooks for Fall and Winter 2015-2016



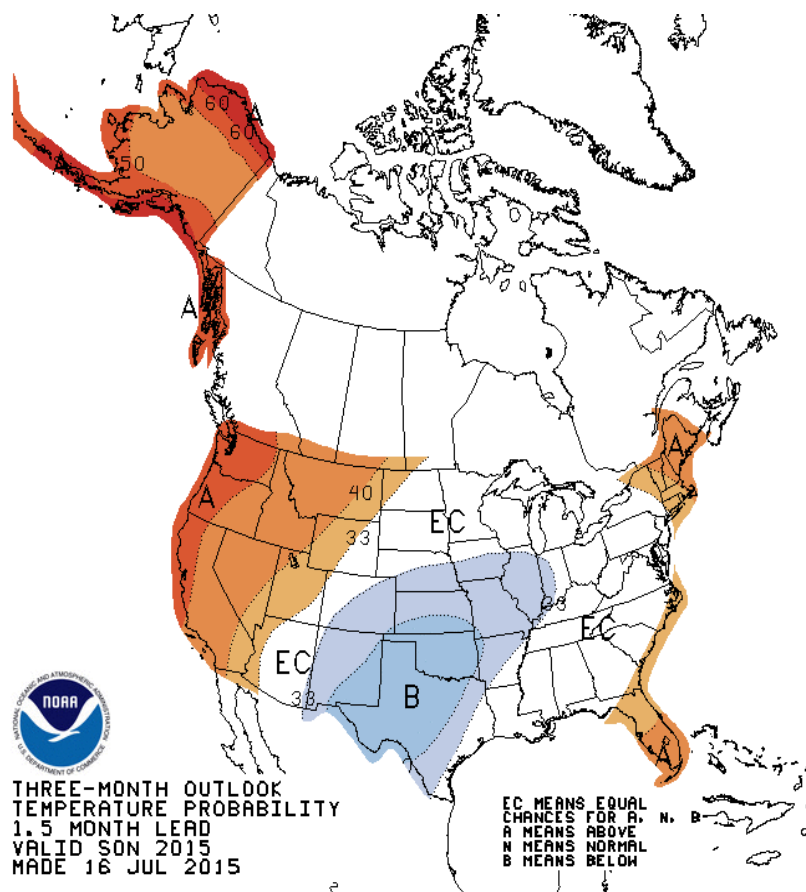
- Outlooks were based primarily on typical atmospheric response to El-Nino assessed using linear regressions with tropical eastern Pacific SST and composites.
- NMME and contributing models were also given some weight through early winter



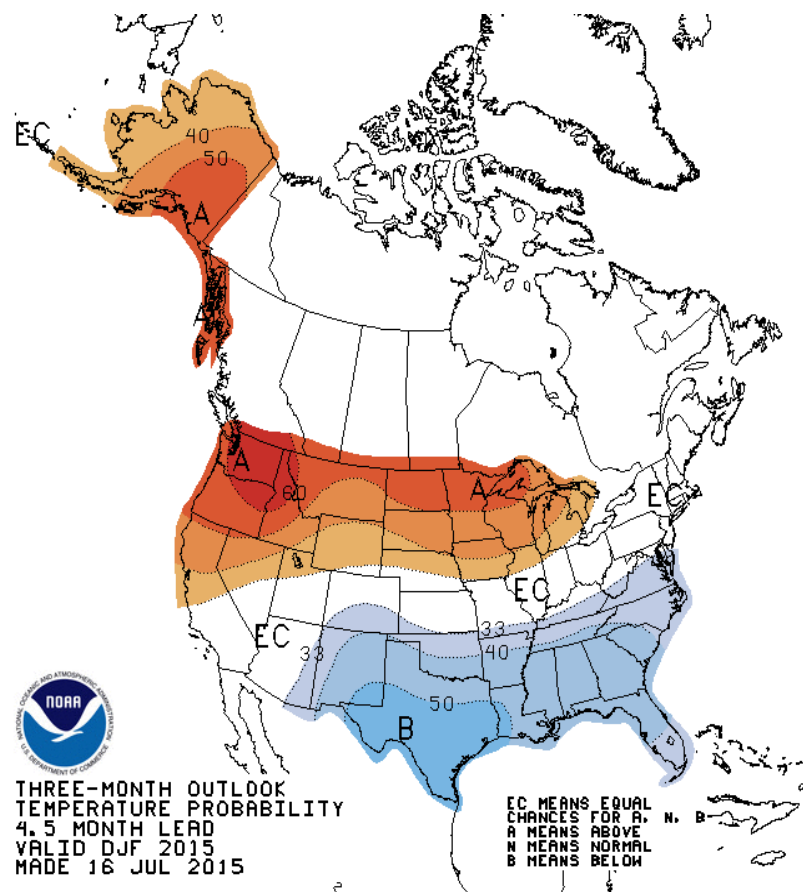
# Fall and Winter Temperature Outlooks



**Sep.-Oct.-Nov.**



**Dec.-Jan.-Feb.**

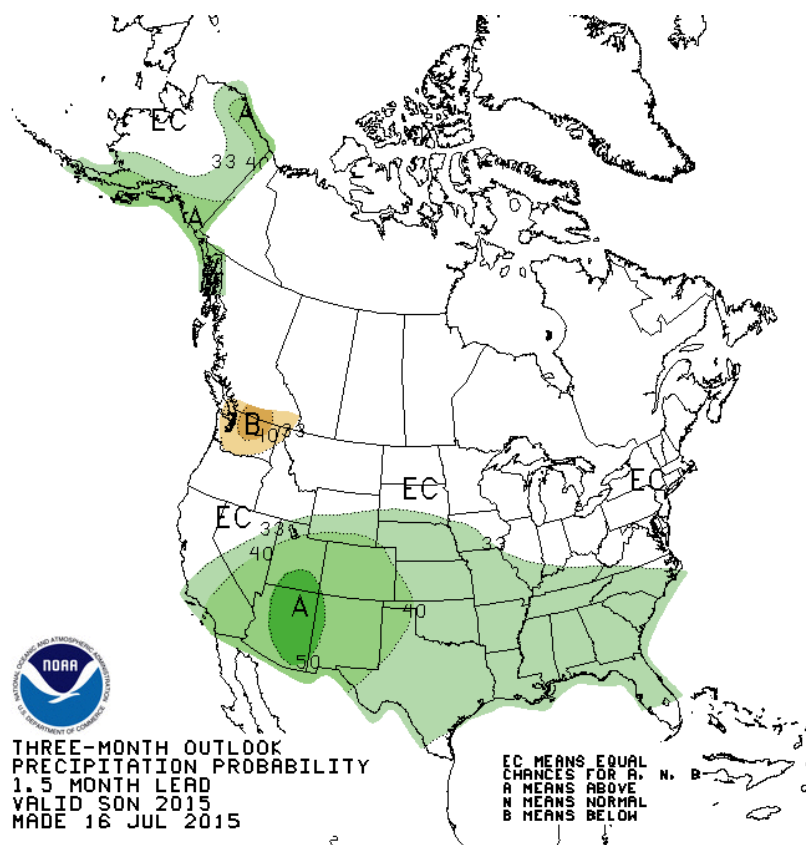




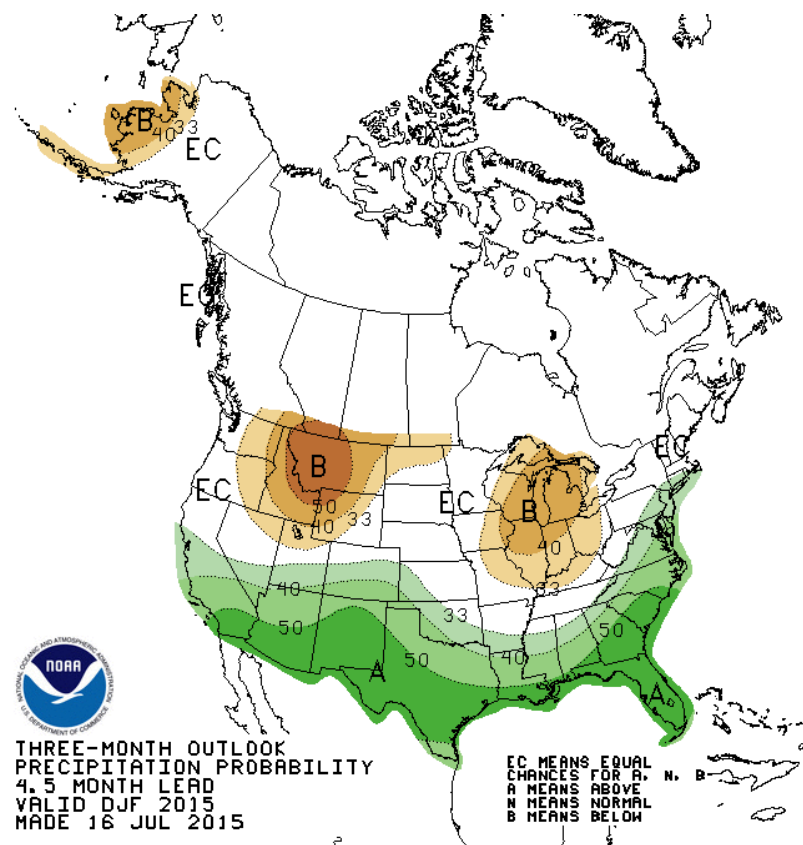
# Fall and Winter Precipitation Outlooks



**Sep.-Oct.-Nov.**



**Dec.-Jan.-Feb.**



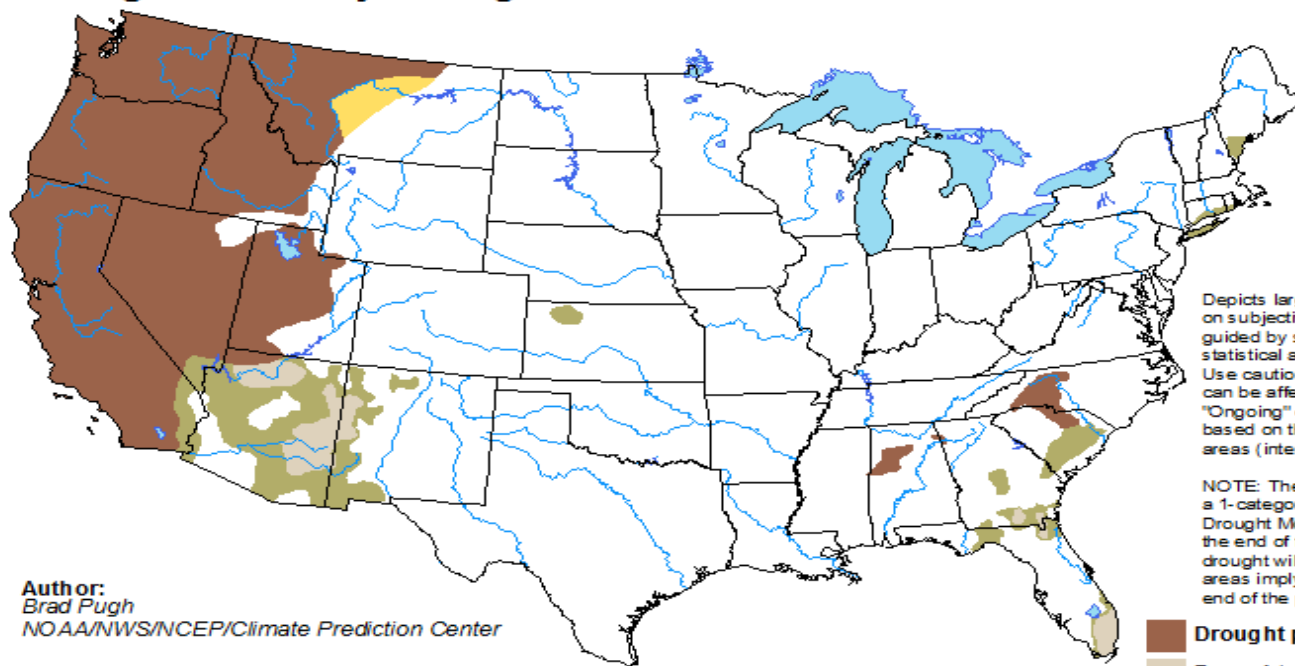


# Drought Outlook for July-October



## U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for July 16 - October 31, 2015  
Released July 16, 2015

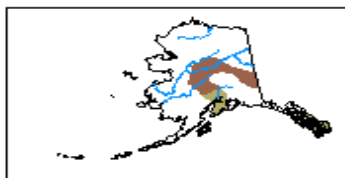


Author:  
Brad Pugh  
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- Drought persists/intensifies
- Drought remains but improves
- Drought removal likely
- Drought development likely



<http://go.usa.gov/hHTe>

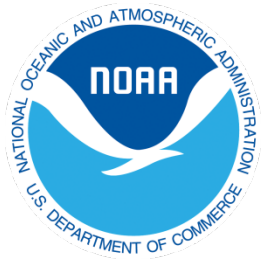


# Summary/Key Points



- CPC is forecasting a greater than 90 percent chance that El-Nino will continue through NH fall. The El-Nino is forecast to be a strong event, i.e. peak SST anomalies greater than 1.5C
- CPC fall and winter temperature and precipitation outlooks are largely following canonical impacts expected from linear regression/composite techniques.
- CPC August to October drought outlook calls for drought improvement in Arizona and western New Mexico and drought development in western Montana.





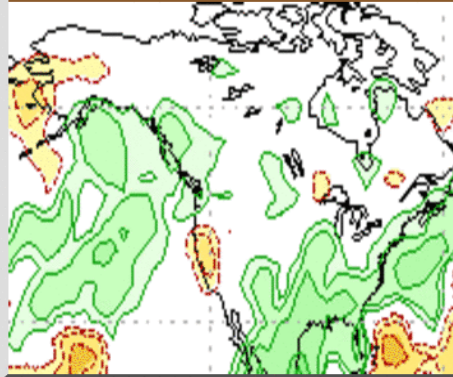
# Extra Slides

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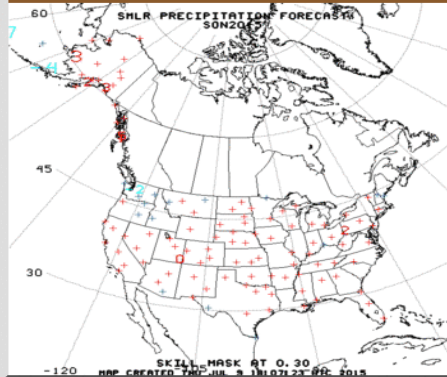


# SON 2015 [Precipitation]

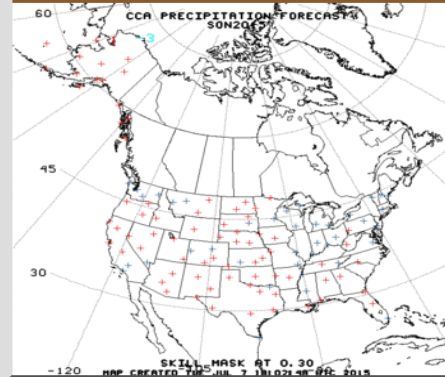
## SST CA (SON 2015)



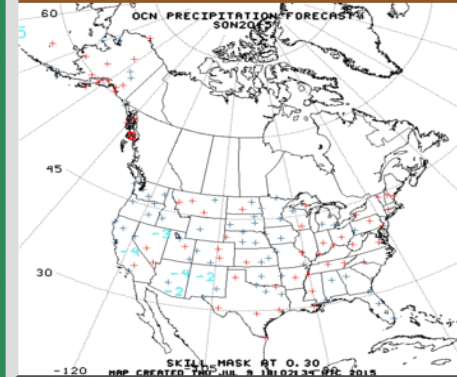
## SMLR



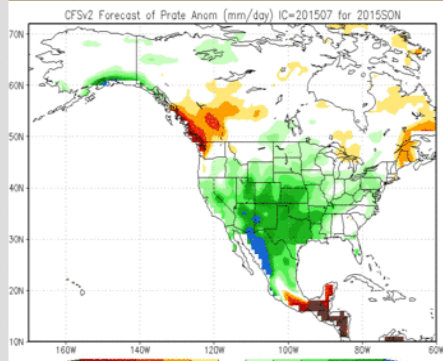
## CCA



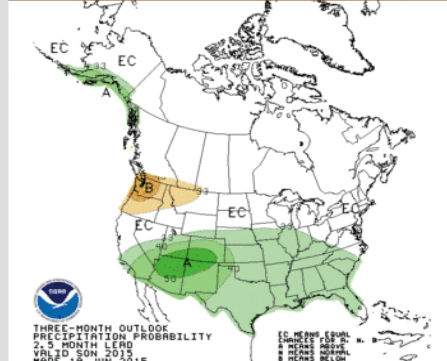
## OCN



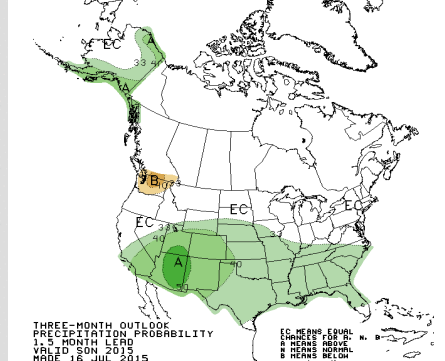
## CFSv2



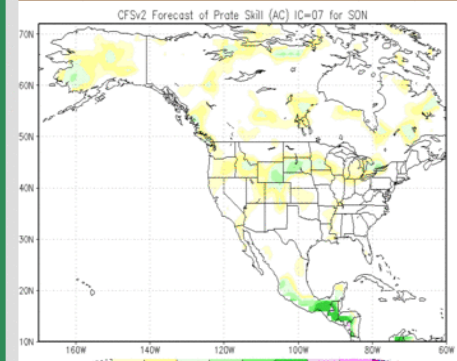
## OLD OUTLOOK



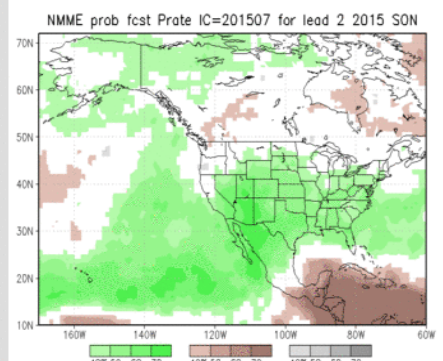
## \*\* NEW OUTLOOK \*\*



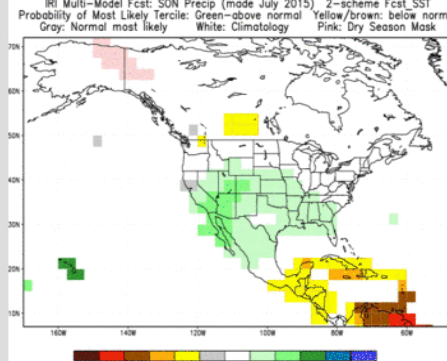
## CFSv2 (skill)



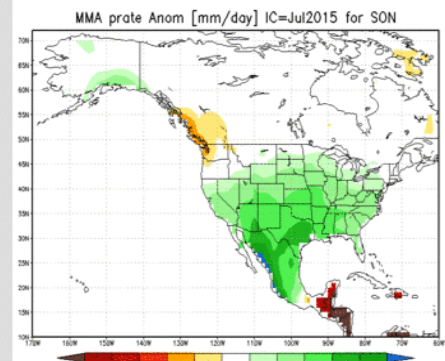
## NMME (Probs)



## IRI



## IMME



## CONSOLIDATION

